

CLAIMS

What is claimed is:

1. A method, comprising:
receiving a first data being directed to a first storage volume;
receiving a second data being directed to a second storage volume;
writing the first data, as part of a first I/O (input/output) process which begins before a selected time, to a first storage image and a second storage image, the first storage image and the second storage image forming a data mirror prior to the selected time, wherein writes to one image are replicated to the other image;
and
writing the second data, as part of a second I/O process which begins after the selected time, to the second storage image but not to the first storage image, the second I/O process being capable of running while the first process runs.
2. The method of claim 1, further comprising replicating data stored on the first storage image to the second storage image, before selected time.
3. The method of claim 2, wherein the selected time is determined relative to a command to preserve data in a data storage system.
4. The method of claim 1, further comprising writing a third data, as part of a third I/O process which begins after the selected time, to the first storage image and to the second storage image, the third data being addressed to the first storage volume.

5. The method of claim 1, further comprising performing a backup operation using the first storage image after the selected time.
6. The method of claim 1, further comprising preventing other requests to access identical areas of the first and the second storage images during the writing of the first data.
7. The method of claim 6, wherein the preventing comprises:
 - acquiring a lock of a lock mechanism before the writing; and
 - releasing the lock of the lock mechanism after the writing is completed.
8. The method of claim 7, wherein the lock mechanism is maintained separately and independently from the first and second storage images.
9. The method of claim 7, wherein if the lock is not available, the method further comprises suspending the writing until the lock is available.
10. The method of claim 1, wherein the writing of the first data further comprises simultaneously writing the first data to a third storage image.
11. A machine-readable medium having executable code to cause a machine to perform a method, the method comprising:
 - receiving a first data being directed to a first storage volume;
 - receiving a second data being directed to a second storage volume;
 - writing the first data, as part of a first I/O (input/output) process which begins before a selected time, to a first storage image and a second storage image, the first storage image and the second storage image forming a data mirror prior to the

selected time, wherein writes to one image are replicated to the other image;
and

writing the second data, as part of a second I/O process which begins after the selected time, to the second storage image but not to the first storage image, the second I/O process being capable of running while the first process runs.

12. The machine-readable medium of claim 11, wherein the method further comprises replicating data stored on the first storage image to the second storage image, before selected time.
13. The machine-readable medium of claim 12, wherein the selected time is determined relative to a command to preserve data in a data storage system.
14. The machine-readable medium of claim 11, wherein the method further comprises writing a third data, as part of a third I/O process which begins after the selected time, to the first storage image and to the second storage image, the third data being addressed to the first storage volume.
15. The machine-readable medium of claim 11, wherein the method further comprises performing a backup operation using the first storage image after the selected time.
16. The machine-readable medium of claim 11, wherein the method further comprises preventing other requests to access identical areas of the first and the second storage images during the writing of the first data.
17. The machine-readable medium of claim 16, wherein the preventing comprises:

- acquiring a lock of a lock mechanism before the writing; and
releasing the lock of the lock mechanism after the writing is completed.
18. The machine-readable medium of claim 17, wherein the lock mechanism is maintained separately and independently from the first and second storage images.
19. The machine-readable medium of claim 17, wherein if the lock is not available, the method further comprises suspending the writing until the lock is available.
20. The machine-readable medium of claim 11, wherein the writing of the first data further comprises simultaneously writing the first data to a third storage image.
21. An apparatus, comprising:
means for receiving a first data being directed to a first storage volume;
means for receiving a second data being directed to a second storage volume;
means for writing the first data, as part of a first I/O (input/output) process which begins before a selected time, to a first storage image and a second storage image, the first storage image and the second storage image forming a data mirror prior to the selected time, wherein writes to one image are replicated to the other image; and
means for writing the second data, as part of a second I/O process which begins after the selected time, to the second storage image but not to the first storage image, the second I/O process being capable of running while the first process runs.
22. The apparatus of claim 21, further comprising means for replicating data stored on the first storage image to the second storage image, before selected time.

23. The apparatus of claim 22, wherein the selected time is determined relative to a command to preserve data in a data storage system.
24. The apparatus of claim 21, further comprising means for writing a third data, as part of a third I/O process which begins after the selected time, to the first storage image and to the second storage image, the third data being addressed to the first storage volume.
25. The apparatus of claim 21, further comprising means for performing a backup operation using the first storage image after the selected time.
26. The apparatus of claim 21, further comprising means for preventing other requests to access identical areas of the first and the second storage images during the writing of the first data.
27. The apparatus of claim 26, wherein the means for preventing comprises:
 - means for acquiring a lock of a lock mechanism before the writing; and
 - means for releasing the lock of the lock mechanism after the writing is completed.
28. The apparatus of claim 27, wherein the lock mechanism is maintained separately and independently from the first and second storage images.
29. The apparatus of claim 27, wherein if the lock is not available, the method further comprises suspending the writing until the lock is available.

30. The apparatus of claim 21, wherein the writing of the first data further comprises simultaneously writing the first data to a third storage image.
31. A data storage system, comprising:
a processing system; and
a memory coupled to the processing system, the memory storing instructions, which when executed by the processing system, cause the processing system to perform the operations of:
receiving a first data being directed to a first storage volume;
receiving a second data being directed to a second storage volume;
writing the first data, as part of a first I/O (input/output) process which begins before a selected time, to a first storage image and a second storage image, the first storage image and the second storage image forming a data mirror prior to the selected time, wherein writes to one image are replicated to the other image; and
writing the second data, as part of a second I/O process which begins after the selected time, to the second storage image but not to the first storage image, the second I/O process being capable of running while the first process runs.
32. The method of claim 1, wherein the second I/O process is capable of accessing the same data, via the second storage image, as the first I/O process.
33. The machine-readable medium of claim 11, wherein the second I/O process is capable of accessing the same data, via the second storage image, as the first I/O process.

34. The apparatus of claim 21, wherein the second I/O process is capable of accessing the same data, via the second storage image, as the first I/O process.